

What is claimed is:

- 1 1. A method of forming a FinFET comprising the steps of:
2 forming at least one fin having a fin height and a fin thickness on a silicon
3 substrate;
4 forming a gate, having a gate height greater than said fin height and
5 intersecting said fin in a body area;
6 forming a conformal layer over said gate and fins;
7 etching said conformal layer directionally until said conformal layer is
8 removed in a source/drain area of said fins, thereby forming a gate cover
9 over said gate up to said fin height; and
10 increasing said fin thickness while said gate is isolated from said set of fins
11 by said gate cover.
- 1 2. A method according to claim 1, in which said gate height is such that
2 said gate cover has a height greater than or equal to said fin height after said
3 step of etching said conformal layer.
- 1 3. A method according to claim 1, further comprising a step of
2 depositing at least one temporary layer over said FinFET;
3 forming a damascene aperture in said temporary layer intersecting said fin
4 in a body area of said fins; and
5 forming a gate in said damascene aperture.
- 1 4. A method according to claim 2, further comprising a step of
2 depositing at least one temporary layer over said FinFET;

3 forming a damascene aperture in said temporary layer intersecting said fin
4 in a body area of said fins; and
5 forming a gate in said damascene aperture.

1 5. A method according to claim 3, further comprising a step of thinning
2 said fin in said damascene aperture, thereby reducing an initial fin thickness
3 in a body region of said fin.

1 6. A method according to claim 4, further comprising a step of thinning
2 said fin in said damascene aperture, thereby reducing an initial fin thickness
3 in a body region of said fin.

1 7. A method according to claim 3, further comprising a step of
2 depositing an epitaxial material on said fins, thereby increasing an initial fin
3 thickness.

1 8. A method according to claim 4, further comprising a step of
2 depositing an epitaxial material on said fins, thereby increasing an initial fin
3 thickness.

1 9. A method according to claim 5, further comprising a step of
2 depositing an epitaxial material on said fins, thereby increasing an initial fin
3 thickness.

1 10. A method according to claim 6, further comprising a step of
2 depositing an epitaxial material on said fins, thereby increasing an initial fin
3 thickness.

1 11. A FinFET comprising at least one fin having a fin height and a fin
2 thickness on a silicon substrate;
3 a gate, having a gate height greater than said fin height formed intersecting
4 said fin in a body area;
5 a gate cover layer formed by etching a conformal layer disposed over said
6 gate and fins;
7 said conformal layer having been etched directionally until said conformal
8 layer is removed in a source/drain area of said fins, thereby forming said
9 gate cover over said gate up to said fin height; and
10 an epitaxial material increasing said fin thickness while said gate is isolated
11 from said set of fins by said gate cover.

1 12. A FinFET according to claim 11, in which said gate height is such
2 that said gate cover has a height greater than or equal to said fin height after
3 said step of etching said conformal layer.

1 13. A FinFET according to claim 11, in which said gate is selfaligned to a
2 body of said FinFET;
3 in a damascene aperture in a temporary layer intersecting said fin in a body
4 area of said fins.

1 14. A FinFET according to claim 12, in which said gate is selfaligned to a
2 body of said FinFET;
3 in a damascene aperture in a temporary layer intersecting said fin in a body
4 area of said fins.

1 15. A FinFET according to claim 13, in which said fin is thinned in said
2 damascene aperture, thereby reducing an initial fin thickness in a body
3 region of said fin.

1 16. A FinFET according to claim 14, in which said fin is thinned in said
2 damascene aperture, thereby reducing an initial fin thickness in a body
3 region of said fin.

1 17. A FinFET according to claim 13, in which said fins have a layer of
2 epitaxial material, thereby increasing an initial fin thickness.

1 18. A FinFET according to claim 14, in which said fins have a layer of
2 epitaxial material, thereby increasing an initial fin thickness.

1 19. A FinFET according to claim 15, in which said fins have a layer of
2 epitaxial material, thereby increasing an initial fin thickness.

1 20. A FinFET according to claim 16, in which said fins have a layer of
2 epitaxial material, thereby increasing an initial fin thickness.